

Azure Developer Community Call

Focus Topic: Introducing the Azure Mission-Critical framework
February 16th, 2023

Contents

- Azure Developer Community 2.0
- Community News
- Service Updates & Announcements
- Introducing the Azure Mission-Critical framework
by Sebastian Bader & Martin Šimeček

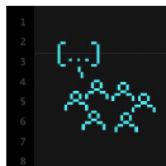


Azure Developer Community 2.0

2 Calls - 1 Community

Formate

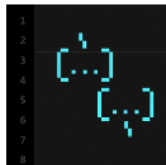
Die Azure Developer Community Calls gibt es in zwei verschiedenen Formaten, die immer im Wechsel stattfinden.



News & Hot Topics

Focus Topic, Azure Updates & Community News

Hol dir Updates zu aktuellen Azure-Ankündigungen, neuen Services und Community-Aktivitäten. Neben den wichtigsten News erhältst du in den News & Hot Topics-Sessions einen Deep Dive zu einem aktuellen Entwicklungs- oder Cloud-Thema.



Ask Me Anything

Wir beantworten deine Fragen

Du arbeitest an einem Azure-Projekt und brauchst einen Rat? Dann komm damit zu den Ask Me Anything-Sessions¹ des Azure Developer Community Calls. Unser Cloud-Native Experte und Host Dennis Zielke und ein Subject Matter Expert aus unserem Team beantworten dort Fragen zu einem Schwerpunktthema, geben dir Tipps und verraten Best Practices.

Contribute to the Community Hub

The screenshot shows the GitHub interface for the `Azure/dev-community` repository. The repository is public and has 15 stars, 1 fork, and 5 watchers. The main branch is `main`. The repository contains a list of files and folders, including `assets`, `awesome-azure`, `azure-updates`, `community-calls`, `.DS_Store`, `CODE_OF_CONDUCT.md`, `CONTRIBUTING.md`, `LICENSE`, `LICENSE-CODE`, and `README.md`. The `README.md` file was updated 2 days ago. The repository also has a `community` tag and a `developer` tag. The `CONTRIBUTING.md` file was updated 5 days ago. The `LICENSE` file was updated to a template last month. The `LICENSE-CODE` file was committed last month. The `CODE_OF_CONDUCT.md` file was created last month. The `community-calls` folder was created 5 days ago. The `azure-updates` folder was updated 2 hours ago. The `awesome-azure` folder was updated 22 hours ago. The `assets` folder was added 2 days ago. The `.DS_Store` file was added 2 days ago. The repository has 321 commits. The repository is managed by `kamath14-apoorva`. The repository has a `main` branch and 1 other branch. The repository has 0 tags. The repository has a `Go to file` button, an `Add file` button, and a `<> Code` button. The repository has an `About` section with links to the `Readme`, `CC-BY-4.0, MIT licenses found`, `Code of conduct`, `15 stars`, `5 watching`, and `1 fork`. The repository has a `Contributors` section with 5 contributors.

Search or jump to... [Pull requests](#) [Issues](#) [Marketplace](#) [Explore](#)

[Azure / dev-community](#) [Public](#) [Edit Pins](#) [Unwatch](#) 5 [Fork](#) 1 [Starred](#) 15

[Code](#) [Issues](#) [Pull requests](#) [Discussions](#) [Actions](#) [Projects](#) [Security](#) [Insights](#) [Settings](#)

[main](#) [1 branch](#) [0 tags](#) [Go to file](#) [Add file](#) [Code](#)

[kamath14-apoorva](#) Update `SEPTEMBER2022.md` `048dc6a` 2 hours ago [321 commits](#)

assets	added digital swag	2 days ago
awesome-azure	Added webinars, ebooks, guides	22 hours ago
azure-updates	Update <code>SEPTEMBER2022.md</code>	2 hours ago
community-calls	Create dummy.md	5 days ago
.DS_Store	added digital swag	2 days ago
CODE_OF_CONDUCT.md	Create <code>CODE_OF_CONDUCT.md</code>	last month
CONTRIBUTING.md	Update <code>CONTRIBUTING.md</code>	5 days ago
LICENSE	<code>LICENSE</code> updated to template	last month
LICENSE-CODE	<code>LICENSE-CODE</code> committed	last month
README.md	Update <code>README.md</code>	2 days ago

About

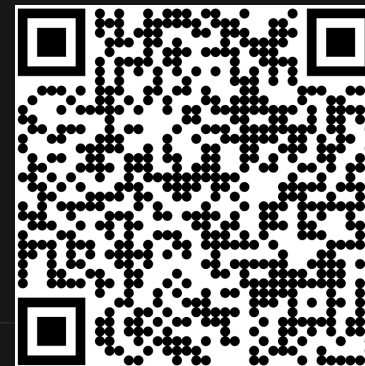
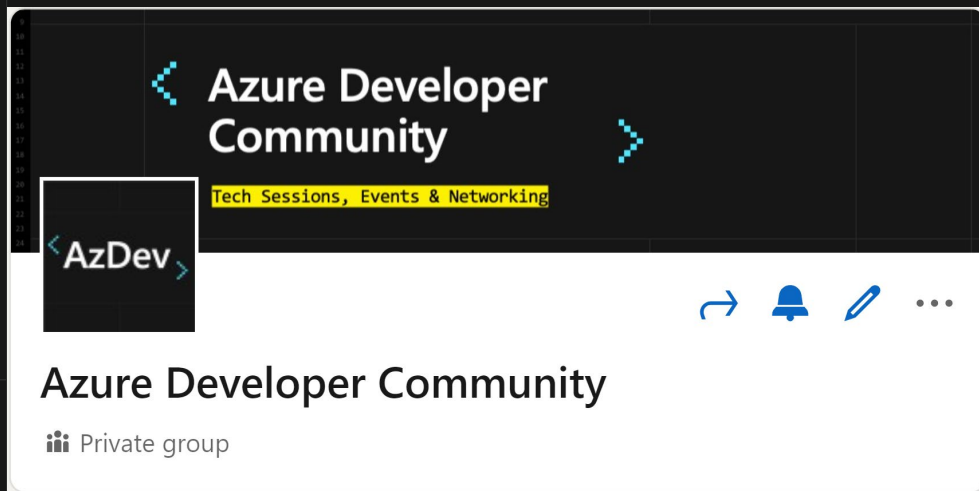
Azure Developer Community

[community](#) [azure](#) [developer](#)

[Readme](#)
[CC-BY-4.0, MIT licenses found](#)
[Code of conduct](#)
[15 stars](#)
[5 watching](#)
[1 fork](#)

Contributors 5






Join our LinkedIn Group





Past & Upcoming events

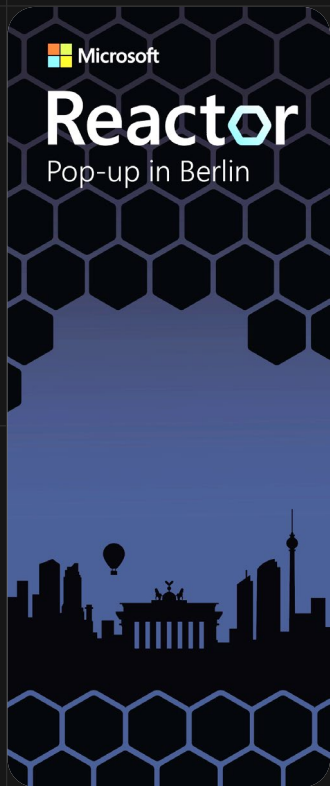
Upcoming community calls

	Date	Format	Topic	QR Code
	Mar 2	Ask Me Anything	Optimizing costs for your cloud native workloads	
	Mar 30	News & Hot Topics	Web development	<i>Available soon, check our Meetup group for updates</i>
	Apr 20	Ask Me Anything	Multi-region Deployments	

Microsoft

React

Microsoft Reactor Popup Berlin



Date	Topic	QR Code
Mar 30	Web development	<i>Available soon, check our Meetup group for updates</i>
Apr 27	Python	<i>Available soon, check our Meetup group for updates</i>

Microsoft Reactor Popup Berlin

Join our group on

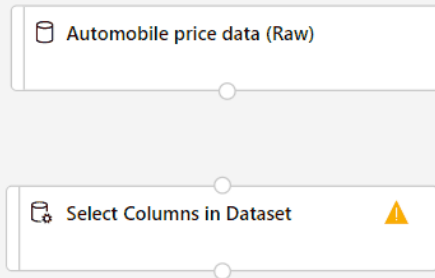
meetup





Azure News & Updates

Azure Machine Learning (Preview)



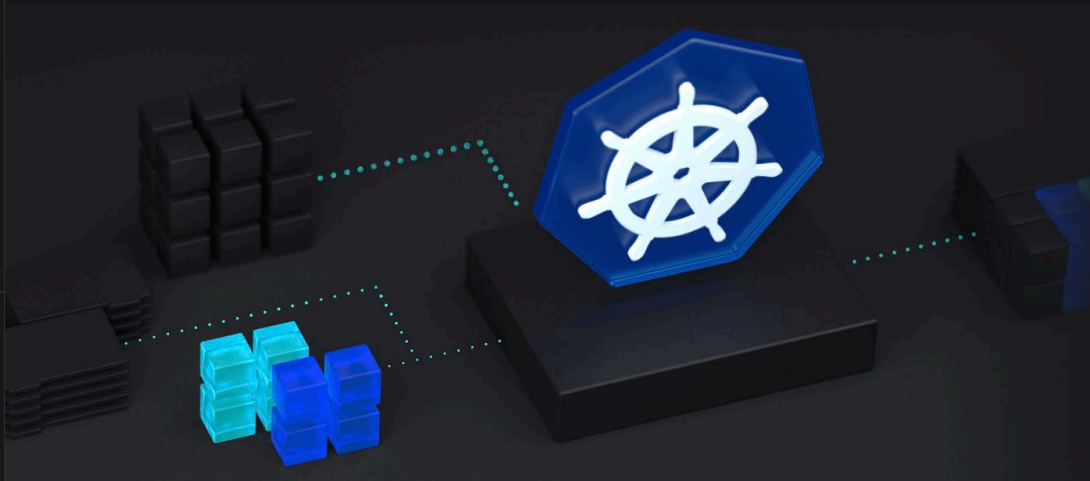
[Learn more](#)

Azure Storage - 5 GB Put Blob (GA)



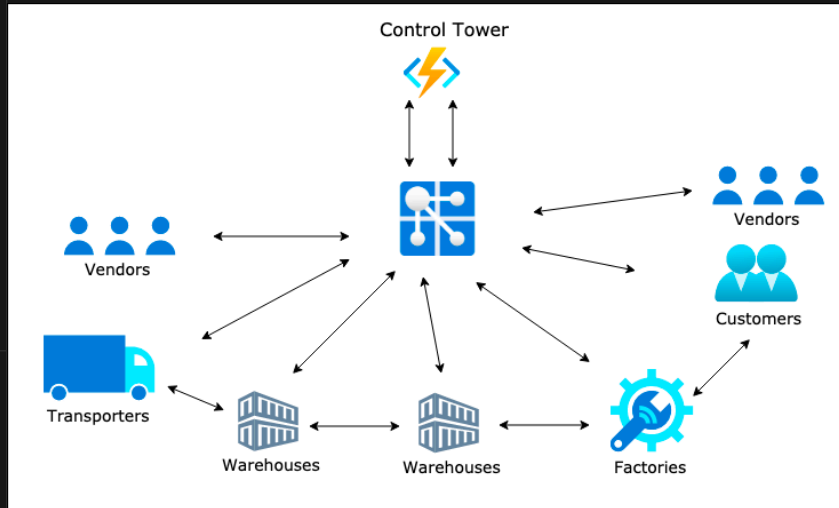
[Learn more](#)

Azure Kubernetes Service - Pricing Tiers



[Learn more](#)

Azure Web PubSub - Premium Tier



[Learn more](#)

Azure Load Testing (GA)

The screenshot shows the Azure Load Testing portal for a resource named 'my-loadtest'. The left sidebar contains navigation links: Overview (selected), Activity log, Access control (IAM), Tags, Tests, Settings (Identity, Encryption, Quotas), Monitoring (Diagnostic settings, Logs), and Support + troubleshooting (New Support Request). The main content area is titled 'my-loadtest Azure Load Testing' and includes a search bar, Refresh, Delete resource, and Give feedback buttons. Below this is an 'Essentials' section with links for Resource group (move), Subscription (move), Status, Location, and Demo subscription. The 'Tests' section is active, showing 'Get started', 'Test runs', and 'Tutorials' tabs. The 'Get started' tab displays the heading 'Load test your application and infrastructure' and three cards: 'Get started with a quick test' (with a 'Quick test' button highlighted by a red box), 'Upload a JMeter script' (with a 'Create' button), and 'Learn more about the service' (with a 'Get started' button). A 'JSON View' link is in the top right corner.

my-loadtest
Azure Load Testing

Search

Refresh Delete resource Give feedback

Overview

Activity log

Access control (IAM)

Tags

Tests

Settings

Identity

Encryption

Quotas

Monitoring

Diagnostic settings

Logs

Support + troubleshooting

New Support Request

Essentials

Resource group ([move](#))

[docs-malt-rg](#)

Status

Location

East US

Subscription ([move](#))

[Demo subscription](#)

Subscription ID

abcdef01-2345-6789-0abc-def012345678

JSON View

Get started Test runs Tutorials

Load test your application and infrastructure

Get started with a quick test

Run a quick load test for a URL without a JMeter script.

Quick test

Upload a JMeter script

Quickly set up a new test with a JMeter script.

Create

Learn more about the service

Identify and monitor performance bottlenecks.

Get started

[Learn more](#)



Hot Topic:

Introducing the Azure Mission-Critical framework



How to build mission-critical applications in Azure

Microsoft Reactor Berlin, Feb 2022

Martin Šimeček, Sebastian Bader

What is a 'mission-critical' app?

What's mission-critical?

Everyone has their own perception of criticality

"How should I build an app on Azure that's always ON and never DOWN?"

What's Azure Mission-critical?

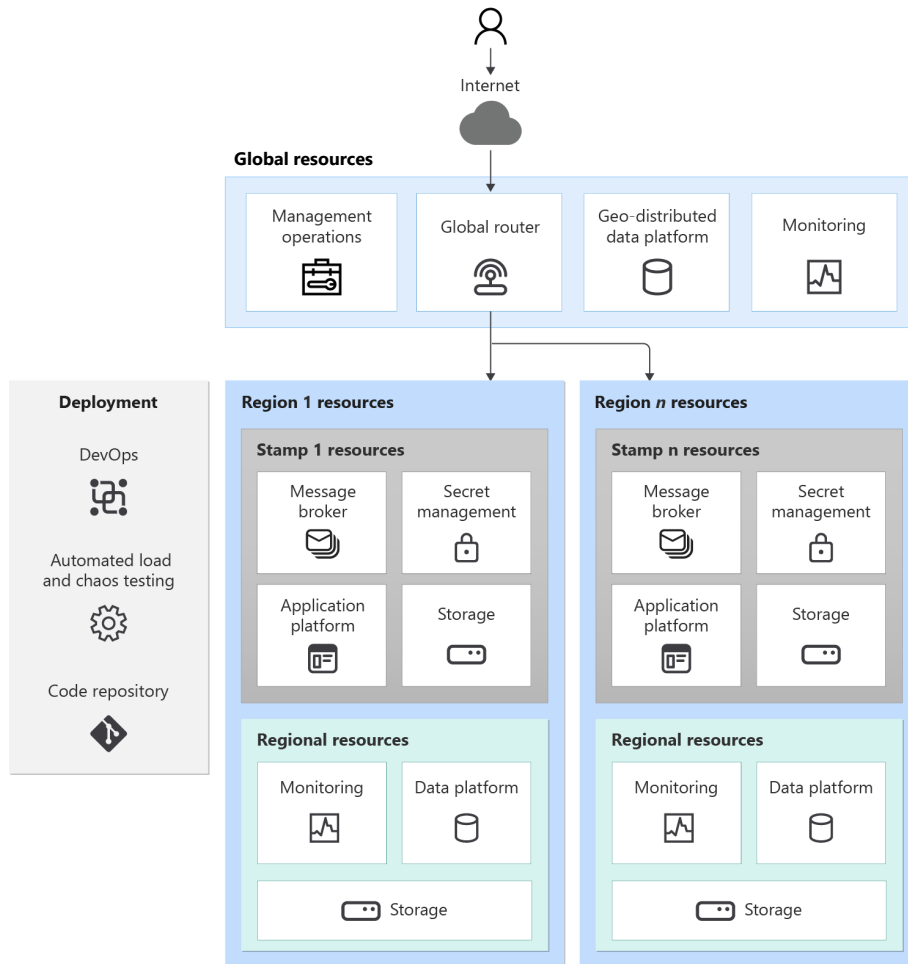
Guidance

Reference implementations

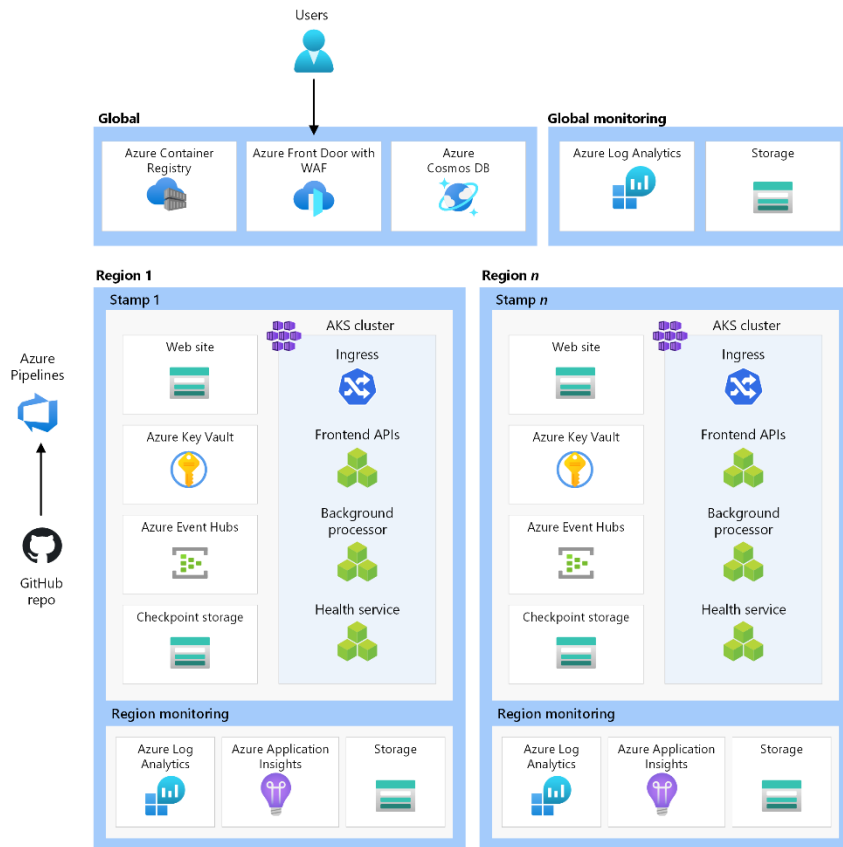
Key principles

- Active/active
- Global vs. regional resources
- Stamps and scale units
- Operational automation by design

Architecture



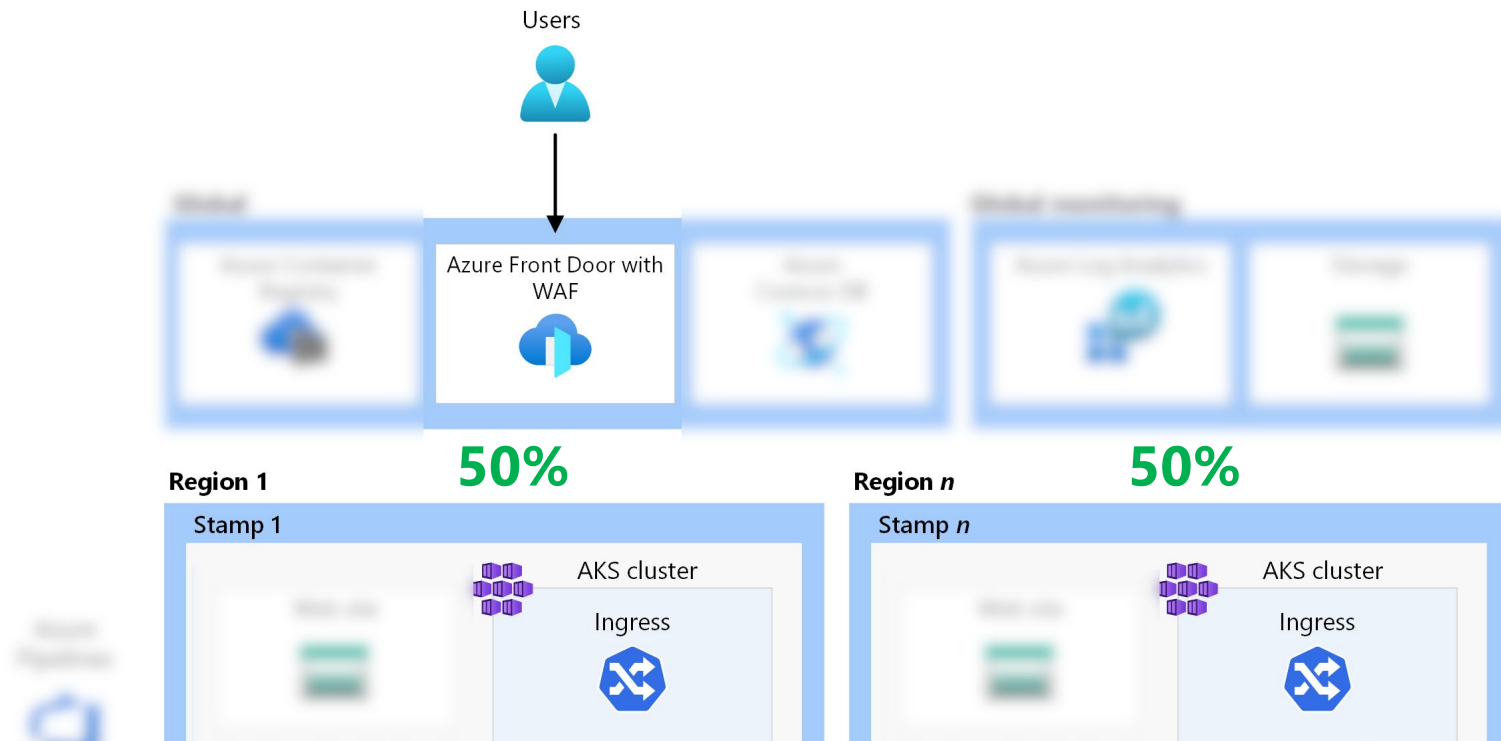
Implementation



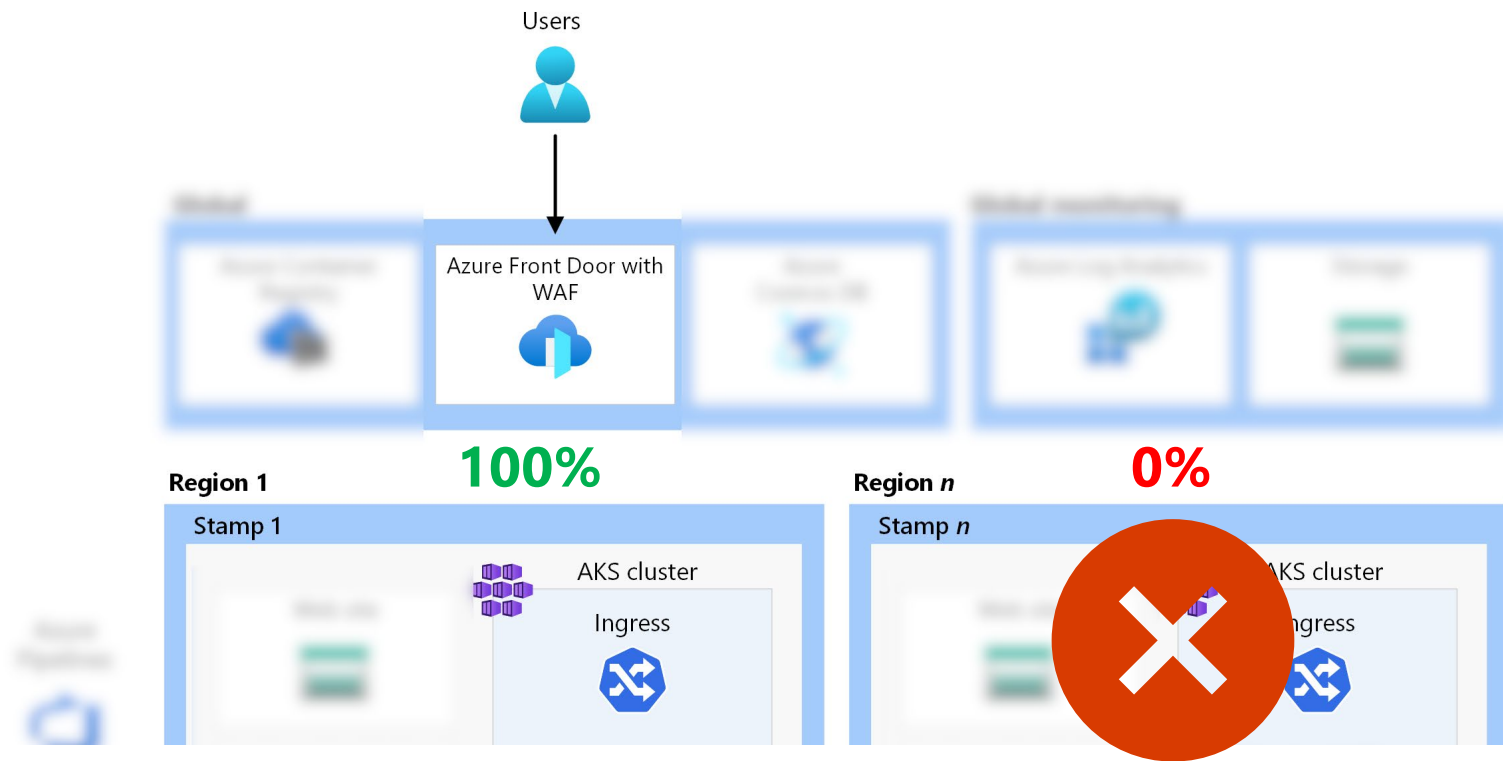
Resiliency & self-healing

The app should not go down. If it does, it should heal automatically.

Automated traffic switch



Automated traffic switch



Demo: Front Door

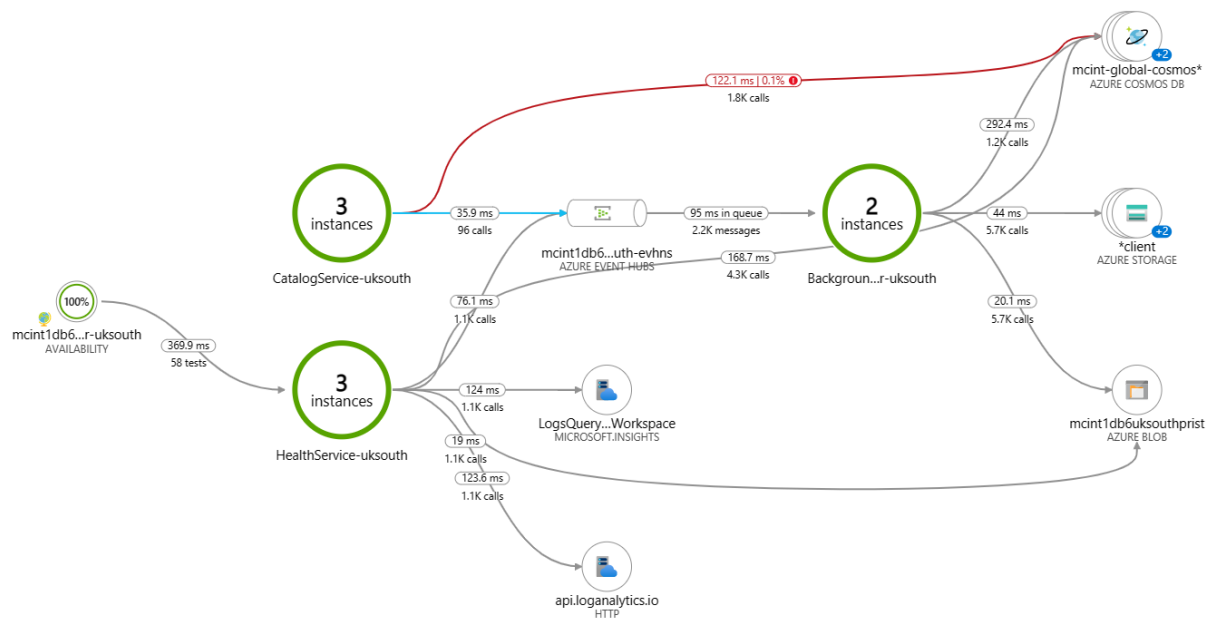
Observability & health modeling

When something bad is about to happen, you need to know right away.

Logs



Distributed tracing



Distributed tracing

End-to-end transaction details

mcint-australia-appi

»

Search results

Learn more

Copy link

Feedback

Leave preview

End-to-end transaction

Operation ID: 3d06e79931fd497088237a30dc20319a, 6bcc90347b401cbf735a583a9b659f1b

= Request (incoming)

= Dependency (outgoing)

EVENT	RES.	DURATION	
mcint8bb5-cluster GET CatalogItem/GetCatalogItemById [itemId/version]	200	2.5 ms	
mcint-global-cosmos-australiaeast GetCatalogItemByIdAsync	200	1.9 ms	
mcint8bb5-cluster GET Comments/GetCommentsByCatalogItemId [itemId]	200	37.4 ms	
mcint8bb5-cluster POST Comments/AddNewItemComment [itemId/version]	202	18.4 ms	
mcint8bb5-australia-evhns EventHubs.Message		19 µs	
Link to EventProcessor.Process		49.8 ms	
Time Spent in Queue		43 ms	
BackgroundProcessor-australiaeast EventProcessor.Process	200	6.8 ms	
mcint-global-cosmos-australiaeast AddNewCommentAsync	201	6.3 ms	
mcint8bb5-australia-evhns EventHubProducerClient.Send		17.6 ms	

»

Create work item

mcint8bb5-cluster

POST Comments/AddNewItemComment [itemId/version]

Request Properties

Show all

Event time	2/16/2023, 2:50:59.2873095 PM (Local time)	...
Name	POST Comments/AddNewItemComment [itemId/version]	...
Response code	202	...
Successful request	true	...
Response time	18.4 ms	...
URL	http://mcint8bb5-cluster.australiaeast.cloudapp.azure.com/catalogservice/api/1.0/catalogitem/6892b16b-91d7-4a1d-bb4a-c8f22f0efe20/comments	...

Custom Properties

AspNetCoreEnvironment	Production	...
-----------------------	------------	-----

Search results

Demo: Observability

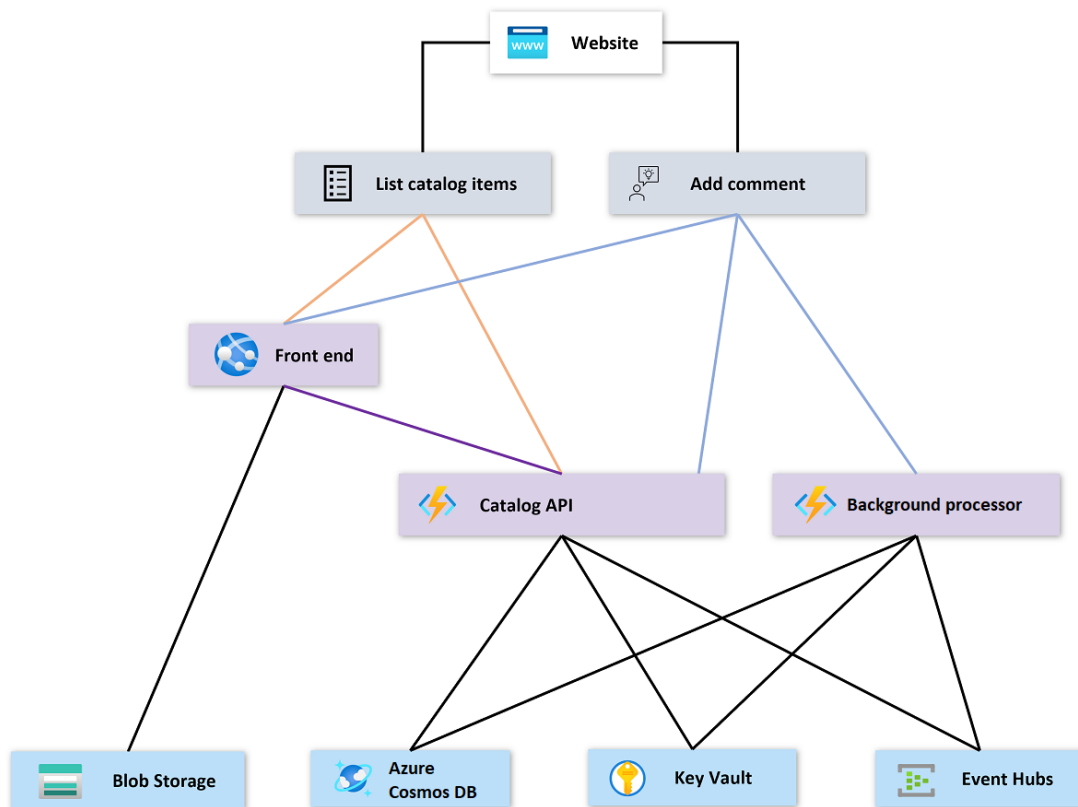
Health modeling

The process of quantifying application health in the context of business requirements and drive automated action.

Health modeling

Use traffic light colors to show if your app is healthy.

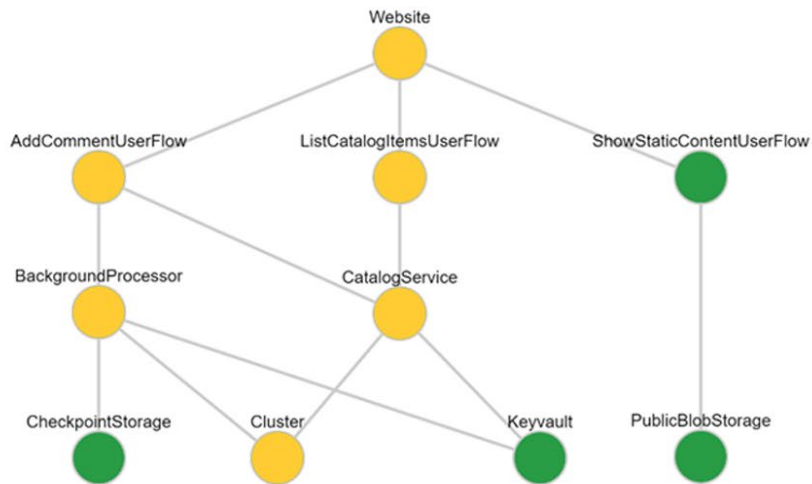
Health model examples



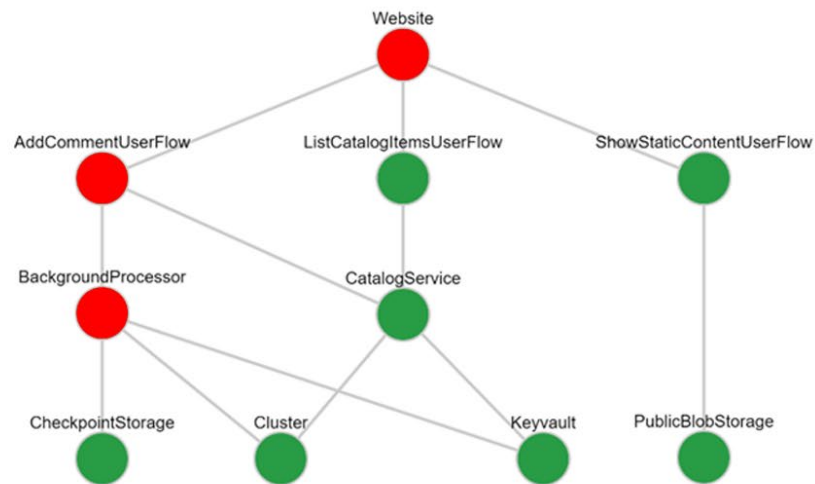
Health model examples

Component	Indicator/metric	Healthy	Degraded	Unhealthy
List catalog items user flow	Underlying health state	Front end healthy and Catalog API healthy		
Add comment user flow	Underlying health state	Front end healthy, Catalog API healthy, and background processor healthy		
Front-end web application	# of non-20x HTTP responses/min	0	1-10	> 10
Catalog API	# of exceptions/sec	< 10	10-50	> 10
	Average processing time (ms)	< 150	150-500	> 500
	Average time in queue (ms)	< 200	200-1,000	> 1,000
Background processor	Average processing time (ms)	< 100	100-200	> 200
	Failure count	< 3	3-10	> 10
	DTU utilization	< 70%	70%-90%	> 90%
Azure Key Vault	Failure count	< 3	3-10	> 10
Azure Event Hubs	Processing backlog length (outgoing/incoming messages)	< 3	3-20	> 20
Azure Blob Storage	Average latency (ms)	< 100	100-200	> 200

Health model examples



Cluster at 70% autoscale capacity



BackgroundProcessor queue has 100 messages

Demo: Health model

Automation & DevOps

No human intervention should be necessary.

Automation & DevOps

IaC for everything

Pipelines for build & deploy

Dev environments on demand

Zero-downtime deployments

No updates, replace whole stamp

Demo: Automation in Azure DevOps

Continuous validation

Systems change, reliability requirements stay and need to be validated.

Continuous validation

Periodic load testing, revisiting baselines

Chaos testing – makes sense together with load testing

Mandatory automated runs on feature changes

- Create a resource
- Home
- Dashboard
- All services
- FAVORITES
- Resource groups
- All resources
- Recent
- App Services
- SQL databases
- Virtual machines
- Subscriptions
- Azure Active Directory
- Monitor
- Microsoft Defender for Cloud
- Advisor
- Storage accounts
- IoT Hub
- Cognitive Services
- App Service plans
- Cost Management + Billing

Home > Resource groups > afe2efcb7-azloadtest-rg > afe2efcb7-azloadtest > 2022-05-11 09:37 load test for build 1387 >

Load Test run by ADO

Initiated on : 5/11/2022, 11:18:55 AM | PREVIEW

View all test runs Stop Refresh Rerun Compare App components Configure metrics Download Share Delete Auto refresh on (5s)

Test run details

Start time	End time	Engine instances	Test result	Status
5/11/2022, 11:18:56 AM		1		Executing

Client-side metrics

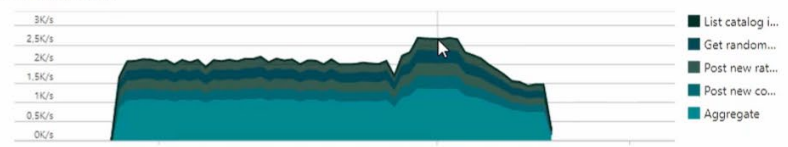
Requests : All Percentile : 90 Error type : All Time range : 5/11/2022, 11:18:56 AM - 5/11/2022, 11:20:07 AM Group by : 5s

Virtual Users (Max)



List catalog items 50 Get random catalog item 50 Post new rating 50 Post new comment 50 Aggregate 50

Requests/sec (Avg)



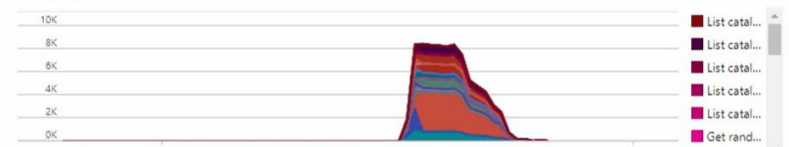
List catalog items 1/2 251,42 /s Get random catalog item 255,87 /s Post new rating 255,83 /s Post new comment 255,78 /s

Response time (successful responses)



List catalog items Pct 90 1/2 82,25 ms Get random catalog item ... 54,43 ms Post new rating Pct 90 75,66 ms Post new comment Pct 90 75,98 ms

Errors (total)



List catalog items Error No... 1/4 0 List catalog items Error 503 7,4 K List catalog items Error 502 654 List catalog items Error 405 0

Server-side metrics

- Create a resource
- Home
- Dashboard
- All services
- FAVORITES
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Home > afe2efcb7-global-rg > afe2efcb7-global-fd

afe2efcb7-global-fd | Metrics

Front Door and CDN profiles

Search (Ctrl+/)

+ New chart Refresh Share Feedback

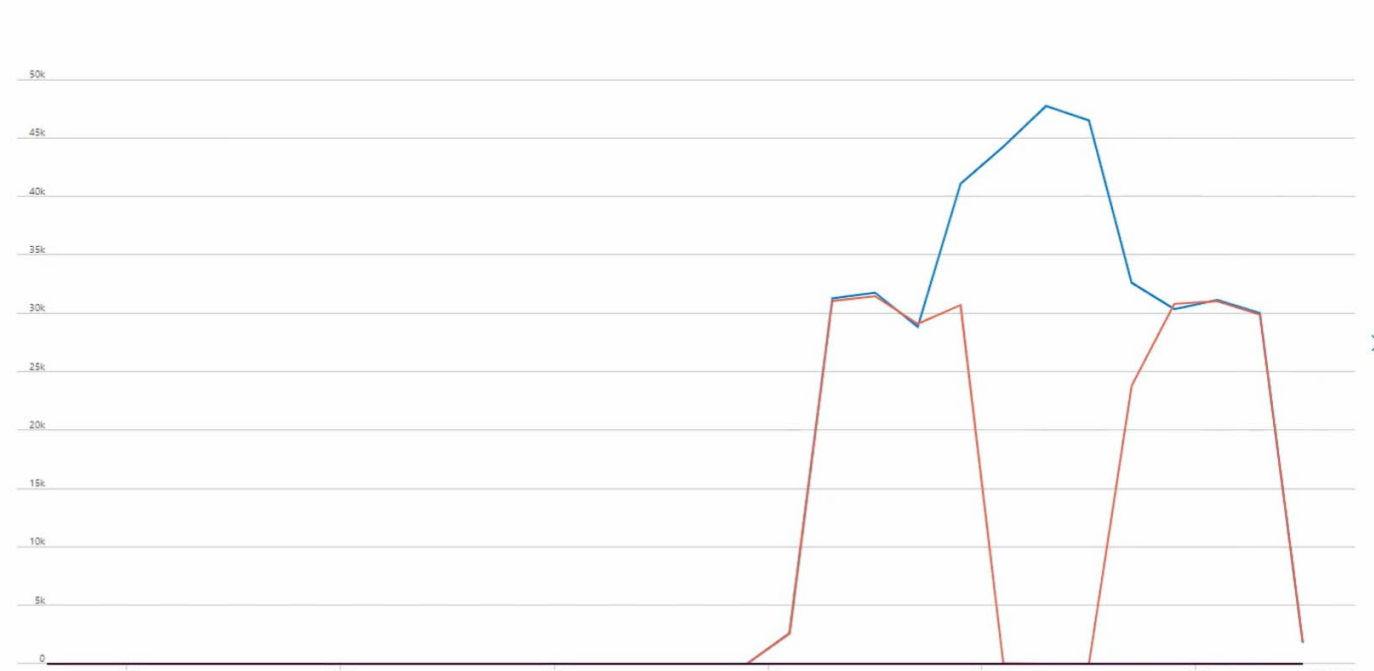
Local Time: Last 30 minutes (Automatic - 1 minu...

- Overview
- Activity log
- Access control (IAM)
- Tags
- Settings
 - Front Door designer
 - Web application firewall
 - Rules engine configuration
 - Properties
 - Locks
- Monitoring
 - Alerts
 - Metrics
 - Diagnostic settings
 - Logs
- Automation
 - Tasks (preview)
 - Export template
- Support + troubleshooting
 - Resource health
 - New Support Request

Sum Backend Request Count for afe2efcb7-global-fd by Backend

Add metric Add filter Apply splitting Line chart Drill into Logs New alert rule Save to dashboard

afe2efcb7-global-fd, Backend Request Count, Sum Split by = Backend



afe2efcb7-cluster-sw...	afe2efcb7-cluster-uk...	afe2efcb7-uk-southpubs...	afe2efcb7-sweden-cenpu...	afe2efcb7-global-ist3...
afe2efcb7-global-fd	afe2efcb7-global-fd	afe2efcb7-global-fd	afe2efcb7-global-fd	afe2efcb7-global-fd
400.04k	242.37k	15	10	4

- Create a resource
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Home > afe2efcb7-global-fd

afe2efcb7-global-fd | Metrics

Front Door and CDN profiles

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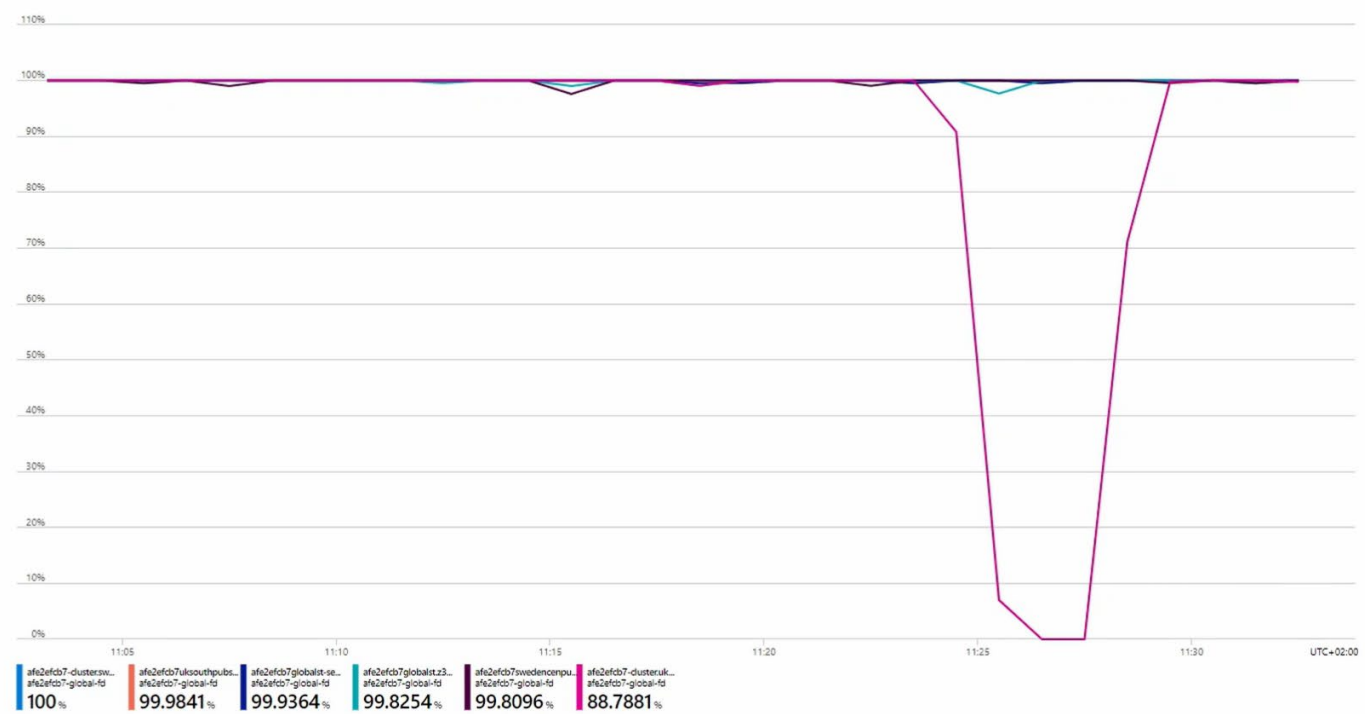
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Avg Backend Health Percentage for afe2efcb7-global-fd by Backend

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Line chart Drill into Logs New alert rule Save to dashboard

afe2efcb7-global-fd, Backend Health Percenta... Avg Split by = Backend

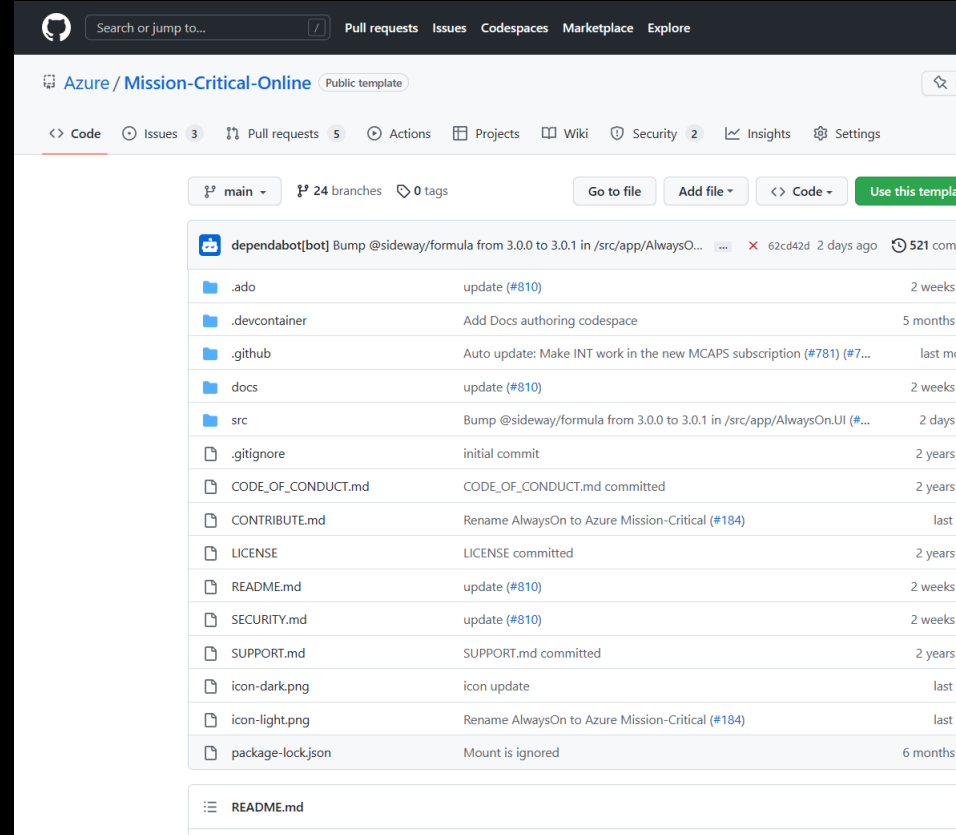


Resources

Azure Mission-critical is open-source

Reference implementations are developed in the open on GitHub.

<https://github.com/Azure/Mission-Critical-Online>



Take a look at the guidance

Full guidance, including specific considerations and recommendations, is available on Microsoft Learn.

[Azure Mission-critical: Microsoft Learn](#)

Filter by title

Microsoft Azure Well-Architected Framework

Overview

- > Reliability
- > Security
- > Cost Optimization
- > Operational Excellence
- > Performance Efficiency
- > Workloads
 - > Mission-critical
 - Quick links

Get started

Design methodology

Design principles

Architecture pattern

Cross-cutting concerns

> Design areas

Assessment tool

> Carrier-grade

> Hybrid

> IoT

> Oracle

> SAP

Learn / Microsoft Azure Well-Architected Framework /

Mission-critical workload documentation

Learn about building highly reliable workloads on Microsoft Azure. The articles provide an approach for designing, building, and operating mission-critical workloads. For a workload, you should always be operational and available. While there are many approaches to accelerate adoption toward cloud native solutions to derive maximum value from

Get started

OVERVIEW

What is a mission-critical workload?

Design methodology

CONCEPT

Architecture pattern

Design principles

Cross-cutting concerns

Design areas

CONCEPT

Application design

Application platform

Data platform

Networking and connectivity

Health modeling

Deployment and testing

Security

Operational procedures

Reference implementations

DEPLOY

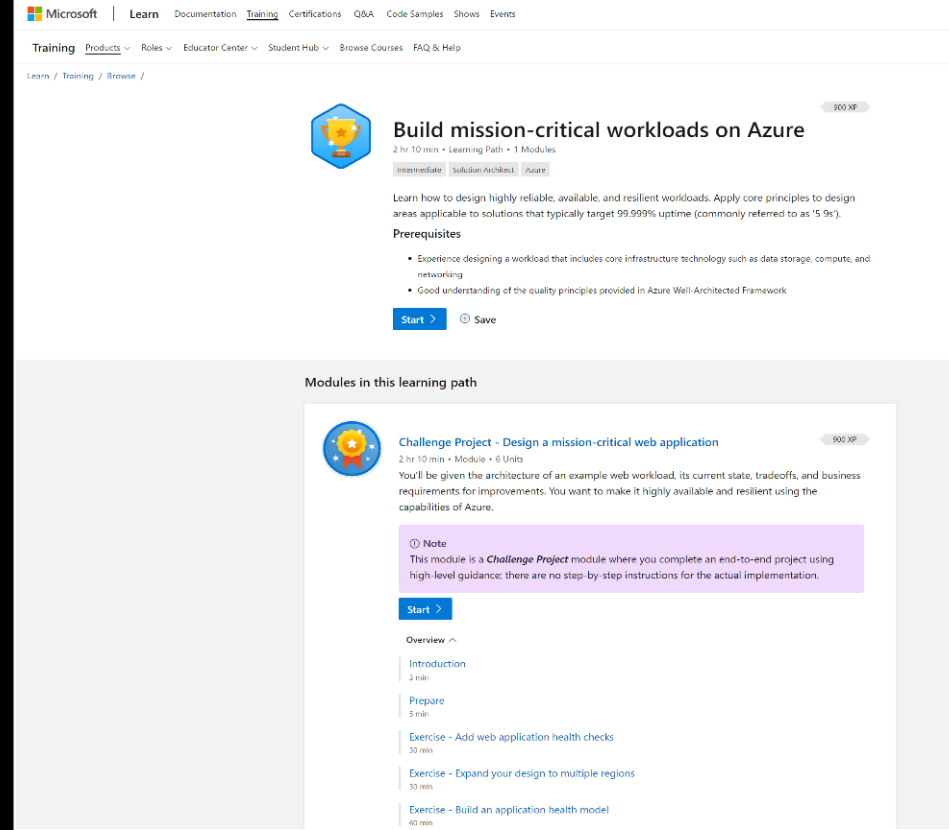
Learn

Learning Mission-critical

Targeted learning modules and training content to help customers absorb mission-critical guidance and technical artefacts.

[Mission-Critical Learning Path](#)

<https://aka.ms/mission-critical/learn>



Microsoft | Learn | Documentation | **Training** | Certifications | Q&A | Code Samples | Shows | Events

Training | **Products** | Roles | Educator Center | Student Hub | Browse Courses | FAQ & Help

Learn / Training / Browse /

Build mission-critical workloads on Azure

2 hr 10 min • Learning Path • 1 Modules

Intermediate | Solution Architect | Azure

Learn how to design highly reliable, available, and resilient workloads. Apply core principles to design areas applicable to solutions that typically target 99.999% uptime (commonly referred to as '5 9s').

Prerequisites

- Experience designing a workload that includes core infrastructure technology such as data storage, compute, and networking
- Good understanding of the quality principles provided in Azure Well-Architected Framework

[Start >](#) [Save](#)

Modules in this learning path

Challenge Project - Design a mission-critical web application

2 hr 10 min • Module • 6 Units

You'll be given the architecture of an example web workload, its current state, tradeoffs, and business requirements for improvements. You want to make it highly available and resilient using the capabilities of Azure.

Note
This module is a **Challenge Project** module where you complete an end-to-end project using high-level guidance; there are no step-by-step instructions for the actual implementation.

[Start >](#)

Overview ^

- Introduction**
2 min
- Prepare**
5 min
- Exercise - Add web application health checks**
30 min
- Exercise - Expand your design to multiple regions**
30 min
- Exercise - Build an application health model**
40 min